University of Colorado
Department of Mathematics
Problem of the Month
October 2008

Let integers a_n, b_n, c_n and d_n be such that

$$(1+\sqrt{2}+\sqrt{3})^n = a_n + b_n\sqrt{2} + c_n\sqrt{3} + d_n\sqrt{6}$$

Find the limits

$$\lim_{n\to\infty} b_n/a_n, \quad \lim_{n\to\infty} c_n/a_n, \quad \lim_{n\to\infty} d_n/a_n$$